## 10/559596 IAP9 Reg'd PCT/PTO 30 NOV 2009

## SEQUENCE LISTING

```
<110> Spies, A. Gregory
      Misher, Lynda
      Corixa Corporation
<120> DNA Vectors
<130> 014058-018410PC
<140> WO PCT/US04/18529
<141> 2004-06-09
<150> US 60/477,232
<151> 2003-06-09
<160> 8
<170> PatentIn Ver. 2.1
<210> 1
<211> 2665
<212> DNA
<213> Artificial Sequence
<220>
<223> Description of Artificial Sequence:expression
      vector DNA plasmid pUC9
<400> 1
gcgcccaata cgcaaaccgc ctctccccgc gcgttggccg attcattaat gcagctggca 60
cgacaggttt cccgactgga aagcgggcag tgagcgcaac gcaattaatg tgagttagct 120
cactcattag gcaccccagg ctttacactt tatgcttccg gctcgtatgt tgtgtggaat 180
tgtgagcgga taacaatttc acacaggaaa cagctatgac catgattacg ccaagcttgg 240
ctgcaggtcg acggatcccc gggaattcac tggccgtcgt tttacaacgt cgtgactggg 300
aaaaccctgg cgttacccaa cttaatcgcc ttgcagcaca tccccctttc gccagctggc 360
gtaatagcga agaggcccgc accgatcgcc cttcccaaca gttgcgcagc ctgaatggcg 420
aatggcgcct gatgcggtat tttctcctta cgcatctgtg cggtatttca caccgcatat 480
ggtgcactct cagtacaatc tgctctgatg ccgcatagtt aagccagccc cgacacccgc 540
caacacccgc tgacgcgccc tgacgggctt gtctgctccc ggcatccgct tacagacaag 600
ctgtgaccgt ctccgggagc tgcatgtgtc agaggttttc accgtcatca ccgaaacgcg 660
cgagacgaaa gggcctcgtg atacgcctat ttttataggt taatgtcatg ataataatgg 720
tttcttagac gtcaggtggc acttttcggg gaaatgtgcg cggaacccct atttgtttat 780
ttttctaaat acattcaaat atgtatccgc tcatgagaca ataaccctga taaatgcttc 840
aataatattg aaaaaggaag agtatgagta ttcaacattt ccgtgtcgcc cttattccct 900
tttttgcggc attttgcctt cctgtttttg ctcacccaga aacgctggtg aaagtaaaag 960
atgctgaaga tcagttgggt gcacgagtgg gttacatcga actggatctc aacagcggta 1020
agateettga gagttttege eeegaagaac gtttteeaat gatgageact tttaaagtte 1080
tgctatgtgg cgcggtatta tcccgtattg acgccgggca agagcaactc ggtcgccgca 1140
tacactattc tcagaatgac ttggttgagt actcaccagt cacagaaaag catcttacgg 1200
atggcatgac agtaagagaa ttatgcagtg ctgccataac catgagtgat aacactgcgg 1260
ccaacttact tetgacaacg ateggaggae egaaggaget aacegetttt ttgcacaaca 1320
tgggggatca tgtaactcgc cttgatcgtt gggaaccgga gctgaatgaa gccataccaa 1380
acgacgagcg tgacaccacg atgcctgtag caatggcaac aacgttgcgc aaactattaa 1440
ctggcgaact acttactcta gcttcccggc aacaattaat agactggatg gaggcggata 1500
aagttgcagg accacttctg cgctcggccc ttccggctgg ctggtttatt gctgataaat 1560
ctggagccgg tgagcgtggg tctcgcggta tcattgcagc actggggcca gatggtaagc 1620
cctcccgtat cgtagttatc tacacgacgg ggagtcaggc aactatggat gaacgaaata 1680
gacagatege tgagataggt geeteactga ttaageattg gtaactgtea gaccaagttt 1740
actcatatat actttagatt gatttaaaac ttcattttta atttaaaagg atctaggtga 1800
agateetttt tgataatete atgaceaaaa teeettaaeg tgagtttteg tteeaetgag 1860
```

<210> 2
<211> 5736
<212> DNA
<213> Artificial Sequence
<220>
<223> Description of Artificial Sequence:expression vector DNA plasmid pRSVneo

<400> 2 cttggaggtg cacaccaatg tggtgaatgg tcaaatggcg tttattgtat cgagctaggc 60 acttaaatac aattatetet geaatgegga atteagtggt tegteeaate catgteagae 120 ctgtctgttg ccttcctaat aaggcacgat cgtaccacct tacttccacc aatcggcatg 180 cacggtgctt tttctctcct tgtaaggcat gttgctaact catcgttacc atgttgcaag 240 actacaagtg tattgcataa gactacattt ccccctccct atgcaaaagc gaaactacta 300 tatectgagg ggaetectaa eegegtacaa eegaageeee gettttegee taaacacac 360 ctagtcccct cagatacgcg tatatctggc ccgtacatcg cgaagcagcg caaaacgcct 420 aaccctaagc agattcttca tgcaattgtc ggtcaagcct tgccttgttg tagcttaaat 480 tttgctcgcg cactactcag cgacctccaa cacacaagca gggagcagat actggcttaa 540 ctatgcggca tcagagcaga ttgtactgag agtgcaccat atgcggtgtg aaataccgca 600 cagatgcgta aggagaaaat accgcatcag gcgctcttcc gcttcctcgc tcactgactc 660 gctgcgctcg gtcgttcggc tgcggcgagc ggtatcagct cactcaaagg cggtaatacg 720 gttatccaca gaatcagggg ataacgcagg aaagaacatg tgagcaaaaa gccagcaaaa 780 ggccaggaac cgtaaaaagg ccgcgttgct ggcgtttttc cataggctcc gccccctga 840 cgagcatcac aaaaatcgac gctcaagtca gaggtggcga aacccgacag gactataaag 900 ataccaggeg tttececetg gaageteest egtgegetet cetgtteega eeetgeeget 960 taccggatac ctgtccgcct ttctcccttc gggaagcgtg gcgctttctc atagctcacg 1020 ctgtaggtat ctcagttcgg tgtaggtcgt tcgctccaag ctgggctgtg tgcacgaacc 1080 ccccgttcag cccgaccgct gcgccttatc cggtaactat cgtcttgagt ccaacccggt 1140 aagacacgac ttatcgccac tggcagcagc cactggtaac aggattagca gagcgaggta 1200 tgtaggcggt gctacagagt tcttgaagtg gtggcctaac tacggctaca ctagaaggac 1260 agtatttggt atctgcgctc tgctgaagcc agttaccttc ggaaaaagag ttggtagctc 1320 ttgatccggc aaacaaacca ccgctggtag cggtggtttt tttgtttgca agcagcagat 1380 tacgcgcaga aaaaaaggat ctcaagaaga tcctttgatc ttttctacgg ggtctgacgc 1440 tcagtggaac gaaaactcac gttaagggat tttggtcatg agattatcaa aaaggatctt 1500 cacctagatc cttttaaatt aaaaatgaag ttttaaatca atctaaagta tatatgagta 1560 aacttggtct gacagttacc aatgcttaat cagtgaggca cctatctcag cgatctgtct 1620 atttcgttca tccatagttg cctgactccc cgtcgtgtag ataactacga tacgggaggg 1680 cttaccatct ggccccagtg ctgcaatgat accgcgagac ccacgctcac cggctccaga 1740 tttatcagca ataaaccagc cagccggaag ggccgagcgc agaagtggtc ctgcaacttt 1800 atccgcctcc atccagtcta ttaattgttg ccgggaagct agagtaagta gttcgccagt 1860 taatagtttg cgcaacgttg ttgccattgc tgcaggcatc gtggtgtcac gctcgtcgtt 1920 tggtatggct tcattcagct ccggttccca acgatcaagg cgagttacat gatcccccat 1980 gttgtgcaaa aaagcggtta gctccttcgg tcctccgatc gttgtcagaa gtaagttggc 2040 cgcagtgtta tcactcatgg ttatggcagc actgcataat tctcttactg tcatgccatc 2100

cgtaagatgc ttttctgtga ctggtgagta ctcaaccaag tcattctgag aatagtgtat 2160 geggegaceg agttgetett geeeggegte aacaegggat aataeegege cacatageag 2220 aactttaaaa gtgctcatca ttggaaaacg ttcttcgggg cgaaaactct caaggatctt 2280 accgctgttg agatccagtt cgatgtaacc cactcgtgca cccaactgat cttcaqcatc 2340 ttttactttc accagcgttt ctgggtgagc aaaaacagga aggcaaaatg ccgcaaaaaa 2400 gggaataagg gcgacacgga aatgttgaat actcatactc ttcctttttc aatattattq 2460 aagcatttat cagggttatt gtctcatgag cggatacata tttgaatgta tttagaaaaa 2520 taaacaaata ggggttccgc gcacatttcc ccgaaaagtg ccacctgacg tctaagaaac 2580 cattattatc atgacattaa cctataaaaa taggcgtatc acgaggccct ttcgtcttca 2640 agaatteett tgeetaattt aaatgaggae ttaaeetgtg gaaatatttt gatgtgggaa 2700 gctgttactg ttaaaactga ggttattggg gtaactgcta tgttaaactt gcattcaggg 2760 acacaaaaaa ctcatgaaaa tggtgctgga aaacccattc aagggtcaaa ttttcatttt 2820 tttgctgttg gtggggaacc tttggagctg cagggtgtgt tagcaaacta caggaccaaa 2880 tatcctgctc aaactgtaac cccaaaaaat gctacagttg acagtcagca gatgaacact 2940 gaccacaagg ctgttttgga taaggataat gcttatccag tggagtgctg ggttcctgat 3000 ccaagtaaaa atgaaaacac tagatatttt ggaacctaca caggtgggga aaatgtgcct 3060 cctgttttgc acattactaa cacagcaacc acagtgcttc ttgatgagca gggtgttggg 3120 cccttgtgca aagctgacag cttgtatgtt tctgctgttg acatttgtgg gctgtttacc 3180 aacacttctg gaacacagca gtggaaggga cttcccagat attttaaaat tacccttaga 3240 aagcggtctg tgaaaaaccc ctacccaatt tcctttttgt taagtgacct aattaacagg 3300 aggacacaga gggtggatgg gcagcctatg attggaatgt cctctcaagt agaggaggtt 3360 agggtttatg aggacacaga ggagcttcct ggggatccag acatgataag atacattgat 3420 gagtttggac aaaccacaac tagaatgcag tgaaaaaaat gctttatttg tgaaatttgt 3480 gatgctattg ctttatttgt aaccattata agctgcaata aacaagttaa caacaacaat 3540 tgcattcatt ttatgtttca ggttcagggg gaggtgtggg aggtttttta aagcaagtaa 3600 aacctctaca aatgtggtat ggctgattat gatctctagt caaggcacta tacatcaaat 3660 attccttatt aaccccttta caaattaaaa agctaaaggt acacaatttt tgagcatagt 3720 tattaatagc agacactcta tgcctgtgtg gagtaagaaa aaacagtatg ttatgattat 3780. aactgttatg cctacttata aaggttacag aatatttttc cataattttc ttgtatagca 3840 gtgcagcttt ttcctttgtg gtgtaaatag caaagcaagc aagagttcta ttactaaaca 3900 cagcatgact caaaaaactt agcaattetg aaggaaagte ettggggtet tetacettte 3960 tettetttt tggaggagta gaatgttgag agteageagt ageeteatea teactagatg 4020 gcatttcttc tgagcaaaac aggttttcct cattaaaggc attccaccac tgctcccatt 4080 catcagttcc ataggttgga atctaaaata cacaaacaat tagaatcagt agtttaacac 4140 attatacact taaaaatttt atatttacct tagagettta aatetetgta ggtagtttgt 4200 ccaattatgt cacaccacag aagtaaggtt ccttcacaaa gatccgggac caaagcggcc 4260 ategtgeete eecaeteetg eagttegggg geatggatge geggatagee getgetggtt 4320 teetggatge egaeggattt geaetgeegg tagaaeteeg egaggtegte eageeteagg 4380 cagcagctga accaactcgc gaggggatcg agcccggggt gggcgaagaa ctccagcatg 4440 agateceege getggaggat catecageeg gegteeegga aaaegattee gaageeeaae 4500 ctttcataga aggcggcggt ggaatcgaaa tctcgtgatg gcaggttggg cgtcgcttgg 4560 teggteattt egaaceecag agteeegete agaagaacte gteaagaagg egatagaagg 4620 cgatgcgctg cgaatcggga gcggcgatac cgtaaagcac gaggaagcgg tcagcccatt 4680 cgccgccaag ctcttcagca atatcacggg tagccaacgc tatgtcctga tagcggtccg 4740 ccacacccag ccggccacag tcgatgaatc cagaaaagcg gccattttcc accatgatat 4800 teggeaagea ggeategeea tgggteaega egagateete geegteggge atgegegeet 4860 tgagcctggc gaacagtteg gctggcgcga gcccctgatg ctcttegtcc agatcatcct 4920 gatcgacaag accggcttcc atccgagtac gtgctcgctc gatgcgatgt ttcgcttggt 4980 ggtcgaatgg gcaggtagcc ggatcaagcg tatgcagccg ccgcattgca tcagccatga 5040 tggatacttt ctcggcagga gcaaggtgag atgacaggag atcctgcccc ggcacttcgc 5100 ccaatagcag ccagtccctt cccgcttcag tgacaacgtc gagcacagct gcgcaaggaa 5160 cgcccgtcgt ggccagccac gatagccgcg ctgcctcgtc ctgcagttca ttcagggcac 5220 cggacaggtc ggtcttgaca aaaagaaccg ggcgccctg cgctgacagc cggaacacgg 5280 cggcatcaga gcagccgatt gtctgttgtg cccagtcata gccgaatagc ctctccaccc 5340 aagcggccgg agaacctgcg tgcaatccat cttgttcaat catgcgaaac gatcctcatc 5400 ctgtctcttg atcagatctt gatcccctgc gccatcagat ccttggcggc aagaaagcca 5460 tccagtttac tttgcagggc ttcccaacct taccagaggg cgccccagct ggcaattccg 5520 gttcgcttgc tgtccataaa accgcccagt ctagctatcg ccatgtaagc ccactgcaag 5580 ctacctgctt tctctttgcg cttgcgtttt cccttgtcca gatagcccag tagctgacat 5640 tcatccgggg tcagcaccgt ttctgcggac tggctttcta cgtgttccgc ttcctttagc 5700 agcccttgcg ccctgagtgc ttgcggcagc gtgaag 5736

```
<210> 3
<211> 3584
<212> DNA
<213> Artificial Sequence
<223> Description of Artificial Sequence: expression
      cassette vector DNA plasmid pCRXA20
<220>
<221> misc_feature
<222> (1)..(1368)
<223> human Towne strain cytomegalovirus (CMV)
      major-immediate early gene viral promoter,
      enhancer and intron A bases 512-1513 and 1736-2094
<220>
<221> misc feature
<222> (1369)..(1416)
<223> annealed oligonucleotide recognition sites for 6
      restriction enzymes
<220>
<221> misc_feature
<222> (1417)..(1651)
<223> plasmid pRSVneo SV40 virus early and late
      polyadenylation signals bases 3407-3634
<220>
<221> misc_feature
<222> (1652)..(2581)
<223> plasmid pUC9 bacterial promoter bases 2463-2600
      and plasmid RSVneo Kanamycin resistance gene bases
      4589-5383
<220>
<221> misc feature
<222> (2582)..(3584)
<223> plasmid pUC9 origin of replication bases 605-1600
<400> 3
gatateatat tggeteatgt ceaacattae egecatgttg acattgatta ttgaetagtt 60
attaatagta atcaattacg gggtcattag ttcatagccc atatatggag ttccgcgtta 120
cataacttac ggtaaatggc ccgcctggct gaccgcccaa cgacccccgc ccattgacqt 180
caataatgac gtatgttccc atagtagcgc caatagggac tttccattga cgtcaatggg 240
tggagtattt acggtaaact gcccacttgg cagtacatca agtgtatcat atgccaagtc 300
cgccccctat tgacgtcaat gacggtaaat ggcccgcctg gcattatgcc cagtacatga 360
ccttacggga ctttcctact tggcagtaca tctacgtatt agtcatcgct attaccatgg 420
tggatgcggt tttggcagta caccaatggg cgtggatagc ggtttgactc acggggattt 480
ccaagtctcc accccattga cgtcaatggg agtttgtttg ggcaccaaaa tcaacgggac 540
tttccaaaat gtcgtaataa ccccgccccg ttgacgcaaa tgggcggtag gcgtgtacgg 600
tgggaggtct atataagcag agctcgttta gtgaaccgtc agatcgcctg gagacgccat 660
ccacgctgtt ttgacctcca tagaagacac cgggaccgat ccagcctccg cggccgggaa 720
cggtgcattg gaacgcggat tccccgtgcc aagagtgacg taagtaccgc ctatagactc 780
tataggcaca cccctttggc tcttatgcat gctatactgt ttttggcttg gggcctatac 840
acccccgctt ccttatgcta taggtgatgg tatagcttag cctataggtg tgggttattg 900
accattattg accactcccc tattggtgac gatactttcc attactaatc cataacatgg 960
ctctttgcca caactatctc tattggctat atgccaatac actgtccttt cgctcggcag 1020
ctccttgctc ctaacagtgg aggccagact taggcacagc acaatgccca ccaccaccag 1080
tgtgccacac aaggccgwgg cggtagggta tgtgtctgaa aatgagctcg gagattgggc 1140
tegeaceget gaegeagatg gaagaettaa ggeageggea gaagaagatg caggeagetg 1200
```

```
agttgttgta ttctgataag agtcagaggt aactcccgtt gcggtgctgt taacggtgga 1260
gggcagtgta gtctgagcag tactcgttgc tgccgcgcgc gccaccagac ataatagctg 1320
acagactaac agactgttcc tttccatggg ttttttctgc agtcaccggt cgaccgaagc 1380
ttcgcccggg cgggatcccg gcggccgccg gaattctgat cataatcagc cataccacat 1440
ttgtagaggt tttacttgct ttaaaaaacc tcccacacct cccctgaac ctgaaacata 1500
aaatgaatgc aattgttgtt gttaacttgt ttattgcagc ttataatggt tacaaataaa 1560
gcaatagcat cacaaatttc acaaataaag cattttttc actgcattct agttgtggtt 1620
tgtccaaact catcaatgta tcttaggtac cacgtcaggt ggcacttttc ggggaaatgt 1680
gcgcggaacc cctatttgtt tatttttcta aatacattca aatatgtatc cgctcatgag 1740
acaataaccc tgataaatgc ttcaataata ttgaaaaagg aagagtatga ttgaacaaga 1800
tggattgcac gcaggttctc cggccgcttg ggtggagagg ctattcggct atgactgggc 1860
acaacagaca atcggctgct ctgatgccgc cgtgttccgg ctgtcagcgc aggggcgccc 1920
ggttcttttt gtcaagaccg acctgtccgg tgccctgaat gaactgcagg acgaggcagc 1980
gcggctatcg tggctggcca cgacgggcgt tccttgcgca gctgtgctcg acgttgtcac 2040
tgaagcggga agggactggc tgctattggg cgaagtgccg gggcaggatc tcctgtcatc 2100
tcaccttgct cctgccgaga aagtatccat catggctgat gcaatgcggc ggctgcatac 2160
tactcggatg gaagccggtc ttgtcgatca ggatgatctg gacgaagagc atcaggggct 2280
cgcgccagcc gaactgttcg ccaggctcaa ggcgcgcatg cccgacggcg aggatctcgt 2340
cgtgacccat ggcgatgcct gcttgccgaa tatcatggtg gaaaatggcc gcttttctgg 2400
attcatcgac tgtggccggc tgggtgtggc ggaccgctat caggacatag cgttggctac 2460
ccgtgatatt gctgaagagc ttggcggcga atgggctgac cgcttcctcg tgctttacgg 2520
tatcgccgct cccgattcgc agcgcatcgc cttctatcgc cttcttgacg agttcttctg 2580
actcgaggcc agctgcatta atgaattggc ccacgcgcgg ggagaggcgg attgcgtatt 2640
gggcgctctt ccgcttcctc gctcactgta ctcgctgcgc tcggtcgttc ggctgcggcg 2700
agcggtatca gctcactcaa aggcggtaat acggttatcc acagaatcag gggataacgc 2760
aggaaagaac atgtgagcaa aaggccagca aaaggccagg aaccgtaaaa aggccgcgtt 2820
gctggcgttt ttccataggc tccgccccc tgacgagcat cacaaaaatc gacgctcaag 2880
tcagaggtgg cgaaacccga caggactata aagataccag gcgtttcccc ctggaagctc 2940
cctcgtgcgc tctcctgttc cgaccctgcc gcttaccgga tacctgtccg cctttctccc 3000
ttcgggaagc gtggcgcttt ctcatagctc acgctgtagg tatctcagtt cggtgtaggt 3060
cgttcgctcc aagctgggct gtgtgcacga accccccgtt cagcccgacc gctgcgcctt 3120
atccggtaac tatcgtcttg agtccaaccc ggtaagacac gacttatcgc cactggcagc 3180
agccactggt aacaggatta gcagagcgag gtatgtaggc ggtgctacag agttcttgaa 3240
gtggtggcct aactacggct acactagaag aacagtattt ggtatctgcg ctctgctgaa 3300
gccagttacc ttcggaaaaa gagttggtag ctcttgatcc ggcaaacaaa ccaccgctgg 3360
tagcggtggt ttttttgttt gcaagcagca gattacgcgc agaaaaaaag gatctcaaga 3420
agateetttg atetttteta eggggtetga egeteagtgg aacgaaaact caegttaagg 3480
gattttggtc atgagattat caaaaaggat cttcacctag atccttttaa attaaaaatg 3540
aagttttaaa tcaatctaaa gtatatatga gtaaacttgg tctg
<210> 4
```

```
<210> 4
<211> 2361
<212> DNA
<213> Artificial Sequence
<220>
<223> Description of Artificial Sequence:Towne strain human cytomegalovirus (CMV) major-immediate early gene viral promoter, enhancer and intron A, CMV_MIE_gene, 5'end
```

```
<400> 4
ctgcagtgaa taataaaatg tgtgtttgtc cgaaatacgc gttttgagat ttctgtcgcc 60
gactaaattc atgtcgcgcg atagtggtgt ttatcgccga tagagatggc gatattggaa 120
aaatcgatat ttgaaaatat ggcatattga aaatgtcgcc gatgtgagtt tctgtgtaac 180
tgatatcgcc attttccaa aagtgattt tgggcatacg cgatatctgg cgatacggct 240
tatatcgttt acgggggatg gcgatagacg actttggcga cttgggcgat tctgtgtgtc 300
gcaaatatcg cagtttcgat ataggtgaca gacgatatga ggctatatcg ccgatagagg 360
cgacatcaag ctggcacatg gccaatgcat atcgatctat acattgaatc aatattggca 420
```

```
attagccata ttagtcattg gttatatagc ataaatcaat attggctatt ggccattgca 480
tacgttgtat ctatatcata atatgtacat ttatattggc tcatgtccaa tatgaccgcc 540
atgttgacat tgattattga ctagttatta atagtaatca attacggggt cattagttca 600
tagcccatat atggagttcc gcgttacata acttacggta aatggcccgc ctcgtgaccg 660
cccaacgacc cccgcccatt gacgtcaata atgacgtatg ttcccatagt aacgccaata 720
gggactttcc attgacgtca atgggtggag tatttacggt aaactgccca cttggcagta 780
catcaagtgt atcatatgcc aagtccggcc ccctattgac gtcaatgacg gtaaatggcc 840
cgcctggcat tatgcccagt acatgacctt acgggacttt cctacttggc agtacatcta 900
cgtattagtc atcgctatta ccatggtgat gcggttttgg cagtacacca atgggcgtgg 960
atagoggttt gactoacggg gatttccaag totocaccc attgacgtca atgggagttt 1020
gttttggcac caaaatcaac gggactttcc aaaatgtcgt aataaccccg ccccgttgac 1080
gcaaatgggc ggtaggcgtg tacggtggga ggtctatata agcagagctc gtttagtgaa 1140
ccgtcagatc gcctggagac gccatccacg ctgttttgac ctccatagaa gacaccggga 1200
ccgatccagc ctccgcggcc gggaacggtg cattggaacg cggattcccc gtgccaagag 1260
tgacgtaagt accgcctata gactctatag gcacacccct ttggctctta tgcatgctat 1320
actgtttttg gcttggggcc tatacacccc cgctccttat gctataggtg atggtatagc 1380
ttagcctata ggtgtgggtt attgaccatt attgaccact cccctattgg tgacgatact 1440
ttccattact aatccataac atggctcttt gccacaacta tctctattgg ctatatgcca 1500
atactctgtc cttcagagac tgacacggac tctgtatttt tacaggatgg ggtcccattt 1560
attatttaca aattcacata tacaacaacg ccgtcccccg tgcccgcagt ttttattaaa 1620
catagogtgg gatctccacg cgaatctcgg gtacgtgttc cggacatggg ctcttctccg 1680
gtagcggcgg agcttccaca tccgagccct ggtcccatgc ctccagcggc tcatggtcgc 1740
teggeagete ettgeteeta acagtggagg ceagaettag geacageaca atgeceacea 1800
ccaccagtgt gccgcacaag gccgtggcgg tagggtatgt gtctgaaaat gagctcggag 1860
attgggctcg caccgtgacg cagatggaag acttaaggca gcggcagaag aagatgcagg 1920
cagctgagtt gttgtattct gataagagtc agaggtaact cccgttgcgg tgctgttaac 1980
ggtggagggc agtgtagtct gagcagtact cgttgctgcc gcgcgcgcca ccagacataa 2040
tagetgaeag actaacagae tgtteettte catgggtett ttetgeagte accgteettq 2100
acacgatgga gtcctctgcc aagagaaaga tggaccctga taatcctgac gagggccctt 2160
cctccaaggt gccacggtac gtgtcggggt ttgtgccccc cctttttttt ataaaattgt 2220
attaatgtta tatacatatc tcctgtatgt gacccatgtg cttatgactc tatttctcat 2280
gtgtttaggc ccgagacacc cgtgaccaag gccacgacgt tcctgcagac tatgttgagg 2340
aaggaggtta acagtcagct g
<210> 5
<211> 34555
<212> DNA
<213> Artificial Sequence
<220>
<223> Description of Artificial Sequence:expression cassette
      replication defective E1 and E3 deleted human adenoviral
      serotype 5 vector DNA plasmid expressing human L523S
      lung squamous cell carcinoma cancer antigen
<220>
<221> misc_feature
<222> (34543)..(34547)
<223> n = g, a, c or t
<400> 5
ttaattaaca tcatcaataa tataccttat tttggattga agccaatatg ataatgaggg 60
ggtggagttt gtgacgtggc gcggggcgtg ggaacggggc gggtgacgta gtagtgtggc 120
ggaagtgtga tgttgcaagt gtggcggaac acatgtaagc gacggatgtg gcaaaagtga 180
cgtttttggt gtgcgccggt gtacacagga agtgacaatt ttcgcgcggt tttaggcgga 240
tgttgtagta aatttgggcg taaccgagta agatttggcc attttcgcgg gaaaactgaa 300
taagaggaag tgaaatctga ataattttgt gttactcata gcgcgtaata ctgtaatagt 360
aatcaattac ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta 420
cggtaaatgg cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga 480
cgtatgttcc catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt 540
```

tacggtaaac tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgccccta 600 ttgacgtcaa tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg 660 actttcctac ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt 720 tttggcagta catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc 780 accccattga cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat 840 gtcgtaacaa ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct 900 atataagcag agctggttta gtgaaccgtc agatccgcta gagatctggt accgtcgacg 960 cggccgctcg agcctaagct tctagagccg ccaccatgaa caaactgtat atcggaaacc 1020 tcagcgagaa cgccgcccc tcggacctag aaagtatctt caaggacgcc aagatcccgg 1080 tgtcgggacc cttcctggtg aagactggct acgcgttcgt ggactgcccg gacgagagct 1140 gggccctcaa ggccatcgag gcgctttcag gtaaaataga actgcacggg aaacccatag 1200 aagttgagca ctcggtccca aaaaggcaaa ggattcggaa acttcagata cgaaatatcc 1260 cgcctcattt acagtgggag gtgctggata gtttactagt ccagtatgga gtggtggaga 1320 gctgtgagca agtgaacact gactcggaaa ctgcagttgt aaatgtaacc tattccagta 1380 aggaccaagc tagacaagca ctagacaaac tgaatggatt tcagttagag aatttcacct 1440 tgaaagtagc ctatatccct gatgaaacgg ccgcccagca aaaccccttg cagcagcccc 1500 gaggtcgccg ggggcttggg cagaggggct cctcaaggca ggggtctcca ggatccgtat 1560 ccaagcagaa accatgtgat ttgcctctgc gcctgctggt tcccacccaa tttgttggag 1620 ccatcatagg aaaagaaggt gccaccattc ggaacatcac caaacagacc cagtctaaaa 1680 tcgatgtcca ccgtaaagaa aatgcggggg ctgctgagaa gtcgattact atcctctcta 1740 ctcctgaagg cacctctgcg gcttgtaagt ctattctgga gattatgcat aaggaagctc 1800 aagatataaa attcacagaa gagatcccct tgaagatttt agctcataat aactttgttg 1860 gacgtcttat tggtaaagaa ggaagaaatc ttaaaaaaat tgagcaagac acagacacta 1920 aaatcacgat atctccattg caggaattga cgctgtataa tccagaacgc actattacag 1980 ttaaaggcaa tgttgagaca tgtgccaaag ctgaggagga gatcatgaag aaaatcaggg 2040 agtottatga aaatgatatt gottotatga atottoaago acatttaatt ootggattaa 2100 atctgaacgc cttgggtctg ttcccaccca cttcagggat gccacctccc acctcagggc 2160 ccccttcage catgactect ccctaccege agtttgagea atcagaaacg gagactgtte 2220 atctgtttat cccagctcta tcagtcggtg ccatcatcgg caagcagggc cagcacatca 2280 agcagettte tegetttget ggagetteaa ttaagattge tecageggaa gcaccagatg 2340 ctaaagtgag gatggtgatt atcactggac caccagaggc tcagttcaag gctcagggaa 2400 gaatttatgg aaaaattaaa gaagaaaact ttgttagtcc taaagaagag gtgaaacttg 2460 aagctcatat cagagtgcca tcctttgctg ctggcagagt tattggaaaa ggaggcaaaa 2520 cggtgaatga acttcagaat ttgtcaagtg cagaagttgt tgtccctcgt gaccagacac 2580 ctgatgagaa tgaccaagtg gttgtcaaaa taactggtca cttctatgct tgccaggttg 2640 cccagagaaa aattcaggaa attctgactc aggtaaagca gcaccaacaa cagaaggctc 2700 tgcaaagtgg accacctcag tcaagacgga agtaatctag agccgccacc atgaacaaac 2760 tgtatatcgg aaacctcagc gagaacgccg cccctcgga cctagaaagt atcttcaagg 2820 acgccaagat cccggtgtcg ggaccettcc tggtgaagac tggctacgcg ttcgtggact 2880 gcccggacga gagctgggcc ctcaaggcca tcgaggcgct ttcaggtaaa atagaactgc 2940 acgggaaacc catagaagtt gagcactcgg tcccaaaaag gcaaaggatt cggaaacttc 3000 agatacgaaa tatcccgcct catttacagt gggaggtgct ggatagttta ctagtccagt 3060 atggagtggt ggagagctgt gagcaagtga acactgactc ggaaactgca gttgtaaatg 3120 taacctattc cagtaaggac caagctagac aagcactaga caaactgaat ggatttcagt 3180 tagagaattt caccttgaaa gtagcctata tccctgatga aacggccgcc cagcaaaacc 3240 ccttgcagca gccccgaggt cgccgggggc ttgggcagag gggctcctca aggcaggggt 3300 ctccaggatc cgtatccaag cagaaaccat gtgatttgcc tctgcgcctg ctggttccca 3360 cccaatttgt tggagccatc ataggaaaag aaggtgccac cattcggaac atcaccaaac 3420 agacccagtc taaaatcgat gtccaccgta aagaaaatgc gggggctgct gagaagtcga 3480 ttactatcct ctctactcct gaaggcacct ctgcggcttg taagtctatt ctggagatta 3540 tgcataagga agctcaagat ataaaattca cagaagagat ccccttgaag attttagctc 3600 ataataactt tgttggacgt cttattggta aagaaggaag aaatcttaaa aaaattgagc 3660 aagacacaga cactaaaatc acgatatctc cattgcagga attgacgctg tataatccag 3720 aacgcactat tacagttaaa ggcaatgttg agacatgtgc caaagctgag gaggagatca 3780 tgaagaaaat cagggagtct tatgaaaatg atattgcttc tatgaatctt caagcacatt 3840 taattcctgg attaaatctg aacgccttgg gtctgttccc acccacttca gggatgccac 3900 ctcccacctc agggccccct tcagccatga ctcctcccta cccgcagttt gagcaatcag 3960 aaacggagac tgttcatctg tttatcccag ctctatcagt cggtgccatc atcggcaagc 4020 agggccagca catcaagcag ctttctcgct ttgctggagc ttcaattaag attgctccag 4080 cggaagcacc agatgctaaa gtgaggatgg tgattatcac tggaccacca gaggctcagt 4140 tcaaggctca gggaagaatt tatggaaaaa ttaaagaaga aaactttgtt agtcctaaag 4200

aagaggtgaa acttgaagct catatcagag tgccatcctt tgctgctggc agagttattg 4260 gaaaaggagg caaaacggtg aatgaacttc agaatttgtc aagtgcagaa gttgttgtcc 4320 ctcgtgacca gacacctgat gagaatgacc aagtggttgt caaaataact ggtcacttct 4380 atgcttgcca ggttgcccag agaaaaattc aggaaattct gactcaggta aagcagcacc 4440 aacaacagaa ggctctgcaa agtggaccac ctcagtcaag acggaagtaa tctagataag 4500 atatccgatc caccggatct agataactga tcataatcag ccataccaca tttgtagagg 4560 ttttacttgc tttaaaaaac ctcccacacc tccccctgaa cctgaaacat aaaatgaatg 4620 caattgttgt tgttaacttg tttattgcag cttataatgg ttacaaataa agcaatagca 4680 tcacaaattt cacaaataaa gcattttttt cactgcattc tagttgtggt ttgtccaaac 4740 tcatcaatgt atcttaacgc ggatctgggc gtggttaagg gtgggaaaga atatataagg 4800 tgggggtctt atgtagtttt gtatctgttt tgcagcagcc gccgccgcca tgagcaccaa 4860 ctcgtttgat ggaagcattg tgagctcata tttgacaacg cgcatgcccc catgggccgg 4920 ggtgcgtcag aatgtgatgg gctccagcat tgatggtcgc cccgtcctgc ccgcaaactc 4980 tactacettg acetacgaga cegtgtetgg aacgeegttg gagaetgeag ceteegeege 5040 cgcttcagcc gctgcagcca ccgcccgcgg gattgtgact gactttgctt tcctgagccc 5100 gcttgcaagc agtgcagctt cccgttcatc cgcccgcgat gacaagttga cggctctttt 5160 ggcacaattg gattetttga cccgggaact taatgtcgtt tetcagcage tgttggatet 5220 gcgccagcag gtttctgccc tgaaggcttc ctccctccc aatgcggttt aaaacataaa 5280 taaaaaacca gactctgttt ggatttggat caagcaagtg tcttgctgtc tttatttagg 5340 ggttttgcgc gcgcggtagg cccgggacca gcggtctcgg tcgttgaggg tcctgtgtat 5400 tttttccagg acgtggtaaa ggtgactctg gatgttcaga tacatgggca taagcccgtc 5460 tctggggtgg aggtagcacc actgcagagc ttcatgctgc ggggtggtgt tgtagatgat 5520 ccagtcgtag caggagcgct gggcgtggtg cctaaaaatg tctttcagta gcaagctgat 5580 tgccaggggc aggcccttgg tgtaagtgtt tacaaagcgg ttaagctggg atgggtgcat 5640 acgtggggat atgagatgca tettggaetg tatttttagg ttggetatgt teccagecat 5700 atccctccgg ggattcatgt tgtgcagaac caccagcaca gtgtatccgg tgcacttggg 5760 aaatttgtca tgtagcttag aaggaaatgc gtggaagaac ttggagacgc ccttgtgacc 5820 tccaagattt tccatgcatt cgtccataat gatggcaatg ggcccacggg cggcggcctg 5880 ggcgaagata tttctgggat cactaacgtc atagttgtgt tccaggatga gatcgtcata 5940 ggccattttt acaaagcgcg ggcggagggt gccagactgc ggtataatgg ttccatccgg 6000 cccaggggcg tagttaccct cacagatttg catttcccac gctttgagtt cagatggggg 6060 gatcatgtct acctgcgggg cgatgaagaa aacggtttcc ggggtagggg agatcagctg 6120 ggaagaaagc aggttcctga gcagctgcga cttaccgcag ccggtgggcc cgtaaatcac 6180 acctattacc ggctgcaact ggtagttaag agagctgcag ctgccgtcat ccctgagcag 6240 gggggccact tcgttaagca tgtccctgac tcgcatgttt tccctgacca aatccgccag 6300 aaggcgctcg ccgcccagcg atagcagttc ttgcaaggaa gcaaagtttt tcaacggttt 6360 gagaccgtcc gccgtaggca tgcttttgag cgtttgacca agcagttcca ggcggtccca 6420 cageteggte acetgeteta eggeateteg atecageata teteetegtt tegegggttg 6480 gggcggcttt cgctgtacgg cagtagtcgg tgctcgtcca gacgggccag ggtcatgtct 6540 ttccacgggc gcagggtcct cgtcagcgta gtctgggtca cggtgaaggg gtgcgctccg 6600 ggctgcgcgc tggccagggt gcgcttgagg ctggtcctgc tggtgctgaa gcgctgccgg 6660 tettegeeet gegegtegge caggtageat ttgaccatgg tgtcatagte cageceetee 6720 gcggcgtggc ccttggcgcg cagcttgccc ttggaggagg cgccgcacga ggggcagtgc 6780 agacttttga gggcgtagag cttgggcgcg agaaataccg attccgggga gtaggcatcc 6840 gegeegeagg ceeegeagac ggtetegeat tecaegagee aggtgagete tggeegtteg 6900 gggtcaaaaa ccaggtttcc cccatgcttt ttgatgcgtt tcttacctct ggtttccatg 6960 agccggtgtc cacgctcggt gacgaaaagg ctgtccgtgt ccccgtatac agacttgaga 7020 gggagtttgt atacagactt gagaggcctg tcctcgagcg gtgttccgcg gtcctcctcg 7080 tatagaaact cggaccactc tgagacaaag gctcgcgtcc aggccagcac gaaggaggct 7140 aagtgggagg ggtagcggtc gttgtccact agggggtcca ctcgctccag ggtgtgaaga 7200 cacatgtcgc cctcttcggc atcaaggaag gtgattggtt tgtaggtgta ggccacgtga 7260 ccgggtgttc ctgaaggggg gctataaaag ggggtggggg cgcgttcgtc ctcactctct 7320 tccgcatcgc tgtctgcgag ggccagctgt tggggtgagt actccctctg aaaagcgggc 7380 atgacttctg cgctaagatt gtcagtttcc aaaaacgagg aggatttgat attcacctgg 7440 cccgcggtga tgcctttgag ggtggccgca tccatctggt cagaaaagac aatctttttg 7500 ttgtcaagct tggtggcaaa cgacccgtag agggcgttgg acagcaactt ggcgatggag 7560 cgcagggttt ggtttttgtc gcgatcggcg cgctccttgg ccgcgatgtt tagctgcacg 7620 tattcgcgcg caacgcaccg ccattcggga aagacggtgg tgcgctcgtc gggcaccagg 7680 tgcacgcgcc aaccgcggtt gtgcagggtg acaaggtcaa cgctggtggc tacctctccg 7740 cgtaggcgct cgttggtcca gcagaggcgg ccgcccttgc gcgagcagaa tggcggtagg 7800 gggtctagct gcgtctcgtc cggggggtct gcgtccacgg taaagacccc gggcagcagg 7860

cgcgcgtcga agtagtctat cttgcatcct tgcaagtcta gcgcctgctg ccatgcgcgg 7920 gcggcaagcg cgcgctcgta tgggttgagt gggggacccc atggcatggg gtgggtgagc 7980 gcggaggcgt acatgccgca aatgtcgtaa acgtagaggg gctctctgag tattccaaga 8040 tatgtagggt agcatcttcc accgcggatg ctggcgcgca cgtaatcgta tagttcgtgc 8100 gagggagcga ggaggtcggg accgaggttg ctacgggcgg gctgctctgc tcggaagact 8160 atctgcctga agatggcatg tgagttggat gatatggttg gacgctggaa gacgttgaag 8220 ctggcgtctg tgagacctac cgcgtcacgc acgaaggagg cgtaggagtc gcgcagcttg 8280 ttgaccagct cggcggtgac ctgcacgtct agggcgcagt agtccagggt ttccttgatg 8340 atgtcatact tatcctgtcc ctttttttc cacagctcgc ggttgaggac aaactcttcg 8400 cggtctttcc agtactcttg gatcggaaac ccgtcggcct ccgaacggta agagcctagc 8460 atgtagaact ggttgacggc ctggtaggcg cagcatccct tttctacggg tagcgcgtat 8520 gcctgcgcgg ccttccggag cgaggtgtgg gtgagcgcaa aggtgtccct gaccatgact 8580 ttgaggtact ggtatttgaa gtcagtgtcg tcgcatccgc cctgctccca gagcaaaaag 8640 teegtgeget ttttggaacg eggatttgge agggegaagg tgacategtt gaagagtate 8700 tttcccgcgc gaggcataaa gttgcgtgtg atgcggaagg gtcccggcac ctcggaacgg 8760 ttgttaatta cctgggcggc gagcacgatc tcgtcaaagc cgttgatgtt gtggcccaca 8820 atgtaaagtt ccaagaagcg cgggatgccc ttgatggaag gcaatttttt aagttcctcg 8880 taggtgagct cttcagggga gctgagcccg tgctctgaaa gggcccagtc tgcaagatga 8940 gggttggaag cgacgaatga gctccacagg tcacgggcca ttagcatttg caggtggtcg 9000 cgaaaggtcc taaactggcg acctatggcc attttttctg gggtgatgca gtagaaggta 9060 agegggtett gtteecageg gteecateea aggttegegg etaggteteg egeggeagte 9120 actagagget cateteegee gaactteatg accageatga agggeaegag etgetteeea 9180 aaggccccca tccaagtata ggtctctaca tcgtaggtga caaagagacg ctcggtgcga 9240 ggatgcgagc cgatcgggaa gaactggatc tcccgccacc aattggagga gtggctattg 9300 atgtggtgaa agtagaagtc cctgcgacgg gccgaacact cgtgctggct tttgtaaaaa 9360 cgtgcgcagt actggcagcg gtgcacgggc tgtacatcct gcacgaggtt gacctgacga 9420 ccgcgcacaa ggaagcagag tgggaatttg agcccctcgc ctggcgggtt tggctggtgg 9480 tettetaett eggetgettg teettgaceg tetggetget egaggggagt taeggtggat 9540 cggaccacca cgccgcgcga gcccaaagtc cagatgtccg cgcgcggcgg tcggagcttg 9600 atgacaacat cgcgcagatg ggagctgtcc atggtctgga gctcccgcgg cgtcaggtca 9660 ggcgggagct cctgcaggtt tacctcgcat agacgggtca gggcgcgggc tagatccagg 9720 tgatacctaa tttccagggg ctggttggtg gcggcgtcga tggcttgcaa gaggccgcat 9780 ccccgcggcg cgactacggt accgcgcggc gggcggtggg ccgcgggggt gtccttggat 9840 gatgcatcta aaagcggtga cgcgggcgag cccccggagg taggggggc tccggacccg 9900 ccgggagagg gggcaggggc acgtcggcgc cgcgcgcggg caggagctgg tgctgcgcc 9960 gtaggttgct ggcgaacgcg acgacgcggc ggttgatctc ctgaatctgg cgcctctgcg 10020 tgaagacgac gggcccggtg agcttgagcc tgaaagagag ttcgacagaa tcaatttcgg 10080 tgtcgttgac ggcggcctgg cgcaaaatct cctgcacgtc tcctgagttg tcttgatagg 10140 cgatctcggc catgaactgc tcgatctctt cctcctggag atctccgcgt ccggctcgct 10200 ccacggtggc ggcgaggtcg ttggaaatgc gggccatgag ctgcgagaag gcgttgaggc 10260 ctccctcgtt ccagacgcgg ctgtagacca cgccccttc ggcatcgcgg gcgcgcatga 10320 ccacctgcgc gagattgagc tccacgtgcc gggcgaagac ggcgtagttt cgcaggcgct 10380 gaaagaggta gttgagggtg gtggcggtgt gttctgccac gaagaagtac ataacccagc 10440 gtcgcaacgt ggattcgttg atatccccca aggcctcaag gcgctccatg gcctcgtaga 10500 agtccacggc gaagttgaaa aactgggagt tgcgcgccga cacggttaac tcctcctcca 10560 gaagacggat gagctcggcg acagtgtcgc gcacctcgcg ctcaaaggct acaggggcct 10620 cttcttcttc ttcaatctcc tcttccataa gggcctcccc ttcttcttct tctggcggcg 10680 gtggggggg ggggacacgg cggcgacgac ggcgcaccgg gaggcggtcg acaaagcgct 10740 cgatcatctc cccgcggcga cggcgcatgg tctcggtgac ggcgcggccg ttctcgcggg 10800 ggcgcagttg gaagacgccg cccgtcatgt cccggttatg ggttggcggg gggctgccat 10860 gcggcaggga tacggcgcta acgatgcatc tcaacaattg ttgtgtaggt actccgccgc 10920 cgagggacct gagcgagtcc gcatcgaccg gatcggaaaa cctctcgaga aaggcgtcta 10980 accagtcaca gtcgcaaggt aggctgagca ccgtggcggg cggcagcggg cggcggtcgg 11040 ggttgtttct ggcggaggtg ctgctgatga tgtaattaaa gtaggcggtc ttgagacggc 11100 ggatggtcga cagaagcacc atgtccttgg gtccggcctg ctgaatgcgc aggcggtcgg 11160 ccatgececa ggettegttt tgacategge geaggtettt gtagtagtet tgeatgagee 11220 tttctaccgg cacttcttct tctccttcct cttgtcctgc atctcttgca tctatcgctg 11280 cggcggcggc ggagtttggc cgtaggtggc gccctcttcc tcccatgcgt gtgaccccga 11340 agcccctcat cggctgaagc agggctaggt cggcgacaac gcgctcggct aatatggcct 11400 gctgcacctg cgtgagggta gactggaagt catccatgtc cacaaagcgg tggtatgcgc 11460 ccgtgttgat ggtgtaagtg cagttggcca taacggacca gttaacggtc tggtgacccg 11520

gctgcgagag ctcggtgtac ctgagacgcg agtaagccct cgagtcaaat acgtagtcgt 11580 tgcaagtccg caccaggtac tggtatccca ccaaaaagtg cggcggcggc tggcggtaga 11640 ggggccagcg tagggtggcc ggggctccgg gggcgagatc ttccaacata aggcgatgat 11700 atccgtagat gtacctggac atccaggtga tgccggcggc ggtggtggag gcgcgcggaa 11760 agtcgcggac gcggttccag atgttgcgca gcggcaaaaa gtgctccatg gtcgggacgc 11820 tctggccggt caggcgcgcg caatcgttga cgctctaccg tgcaaaagga gagcctgtaa 11880 gegggeacte tteegtggte tggtggataa attegeaagg gtateatgge ggaegaeegg 11940 ggttcgagcc ccgtatccgg ccgtccgccg tgatccatgc ggttaccgcc cgcgtgtcga 12000 acccaggtgt gcgacgtcag acaacggggg agtgctcctt ttggcttcct tccaggcgcg 12060 gcggctgctg cgctagcttt tttggccact ggccgcgcgc agcgtaagcg gttaggctgg 12120 aaagcgaaag cattaagtgg ctcgctccct gtagccggag ggttattttc caagggttga 12180 gtcgcgggac ccccggttcg agtctcggac cggccggact gcggcgaacg ggggtttgcc 12240 teccegteat geaagaceee gettgeaaat teeteeggaa acagggaega geeeettttt 12300 tgcttttccc agatgcatcc ggtgctgcgg cagatgcgcc cccctcctca gcagcggcaa 12360 gcgacatccg cggttgacgc ggcagcagat ggtgattacg aacccccgcg gcgccgggcc 12480 cggcactacc tggacttgga ggagggcgag ggcctggcgc ggctaggagc gccctctcct 12540 gagcggtacc caagggtgca gctgaagcgt gatacgcgtg aggcgtacgt gccgcggcag 12600 aacctgtttc gcgaccgcga gggagaggag cccgaggaga tgcgggatcg aaagttccac 12660 gcagggcgcg agctgcggca tggcctgaat cgcgagcggt tgctgcgcga ggaggacttt 12720 gagcccgacg cgcgaaccgg gattagtccc gcgcgcgcac acgtggcggc cgccgacctg 12780 gtaaccgcat acgagcagac ggtgaaccag gagattaact ttcaaaaaag ctttaacaac 12840 cacgtgcgta cgcttgtggc gcgcgaggag gtggctatag gactgatgca tctgtgggac 12900 tttgtaagcg cgctggagca aaacccaaat agcaagccgc tcatggcgca gctgttcctt 12960 atagtgcagc acagcaggga caacgaggca ttcagggatg cgctgctaaa catagtagag 13020 cccgagggcc gctggctgct cgatttgata aacatcctgc agagcatagt ggtgcaggag 13080 cgcagcttga gcctggctga caaggtggcc gccatcaact attccatgct tagcctgggc 13140 aagttttacg cccgcaagat ataccatacc ccttacgttc ccatagacaa ggaggtaaag 13200 atcgaggggt tctacatgcg catggcgctg aaggtgctta ccttgagcga cgacctgggc 13260 gtttatcgca acgagcgcat ccacaaggcc gtgagcgtga gccggcggcg cgagctcagc 13320 gaccgcgagc tgatgcacag cctgcaaagg gccctggctg gcacgggcag cggcgataga 13380 gaggccgagt cctactttga cgcgggcgct gacctgcgct gggccccaag ccgacgcgcc 13440 ctggaggcag ctggggccgg acctgggctg gcggtggcac ccgcgcgcgc tggcaacgtc 13500 ggcggcgtgg aggaatatga cgaggacgat gagtacgagc cagaggacgg cgagtactaa 13560 gcggtgatgt ttctgatcag atgatgcaag acgcaacgga cccggcggtg cgggcggcgc 13620 tgcagagcca gccgtccggc cttaactcca cggacgactg gcgccaggtc atggaccgca 13680 teatgteget gaetgegege aateetgaeg egtteeggea geageegeag geeaacegge 13740 teteegeaat tetggaageg gtggteeegg egegegeaaa eeceaegeae gagaaggtge 13800 tggcgatcgt aaacgcgctg gccgaaaaca gggccatccg gcccgacgag gccggcctgg 13860 tctacgacgc gctgcttcag cgcgtggctc gttacaacag cggcaacgtg cagaccaacc 13920 tggaccggct ggtggggat gtgcgcgagg ccgtggcgca gcgtgagcgc gcgcagcagc 13980 agggcaacct gggctccatg gttgcactaa acgccttcct gagtacacag cccgccaacg 14040 tgccgcgggg acaggaggac tacaccaact ttgtgagcgc actgcggcta atggtgactg 14100 agacacegea aagtgaggtg taccagtetg ggecagaeta ttttttecag accagtagae 14160 aaggeetgea gaeegtaaae etgageeagg ettteaaaaa ettgeagggg etgtgggggg 14220 tgegggetee caeaggegae egegegaeeg tgtetagett getgaegeee aactegegee 14280 tgttgctgct gctaatagcg cccttcacgg acagtggcag cgtgtcccgg gacacatacc 14340 taggtcactt gctgacactg taccgcgagg ccataggtca ggcgcatgtg gacgagcata 14400 ctttccagga gattacaagt gtcagccgcg cgctggggca ggaggacacg ggcagcctgg 14460 aggeaaceet aaactacetg etgaceaace ggeggeagaa gateeeeteg ttgeacagtt 14520 taaacagcga ggaggagcgc attttgcgct acgtgcagca gagcgtgagc cttaacctga 14580 tgcgcgacgg ggtaacgccc agcgtggcgc tggacatgac cgcgcgcaac atggaaccgg 14640 gcatgtatgc ctcaaaccgg ccgtttatca accgcctaat ggactacttg catcgcgcgg 14700 Ccgccgtgaa ccccgagtat ttcaccaatg ccatcttgaa cccgcactgg ctaccgcccc 14760 ctggtttcta caccggggga ttcgaggtgc ccgagggtaa cgatggattc ctctgggacg 14820 acatagacga cagcgtgttt tccccgcaac cgcagaccct gctagagttg caacagcgcg 14880 agcaggcaga ggcggcgctg cgaaaggaaa gcttccgcag gccaagcagc ttgtccgatc 14940 taggcgctgc ggccccgcgg tcagatgcta gtagcccatt tccaagcttg atagggtctc 15000 ttaccagcac tcgcaccacc cgcccgcgcc tgctgggcga ggaggagtac ctaaacaact 15060 cgctgctgca gccgcagcgc gaaaaaaacc tgcctccggc atttcccaac aacgggatag 15120 agagcctagt ggacaagatg agtagatgga agacgtacgc gcaggagcac agggacgtgc 15180

caggecegeg ecegeceace egtegteaaa ggeacgaceg teageggggt etggtgtggg 15240 aggacgatga ctcggcagac gacagcagcg tcctggattt gggagggagt ggcaacccgt 15300 ttgcgcacct tcgccccagg ctggggagaa tgttttaaaa aaaaaaaagc atgatgcaaa 15360 ataaaaaact caccaaggcc atggcaccga gcgttggttt tcttgtattc cccttagtat 15420 gcggcgcgcg gcgatgtatg aggaaggtcc tcctccctcc tacgagagtg tggtgagcgc 15480 ggcgccagtg gcggcggcgc tgggttctcc cttcgatgct cccctggacc cgccgtttgt 15540 gcctccgcgg tacctgcggc ctaccggggg gagaaacagc atccgttact ctgagttggc 15600 acccctattc gacaccaccc gtgtgtacct ggtggacaac aagtcaacgg atgtggcatc 15660 cctgaactac cagaacgacc acagcaactt tctgaccacg gtcattcaaa acaatgacta 15720 cagcccgggg gaggcaagca cacagaccat caatcttgac gaccggtcgc actggggcgg 15780 cgacctgaaa accatcctgc ataccaacat gccaaatgtg aacgagttca tgtttaccaa 15840 taagtttaag gcgcgggtga tggtgtcgcg cttgcctact aaggacaatc aggtggagct 15900 gaaatacgag tgggtggagt tcacgctgcc cgagggcaac tactccgaga ccatgaccat 15960 agacettatg aacaacgega tegtggagea etaettgaaa gtgggeagae agaacggggt 16020 tctggaaagc gacatcgggg taaagtttga cacccgcaac ttcagactgg ggtttgaccc 16080 cgtcactggt cttgtcatgc ctggggtata tacaaacgaa gccttccatc cagacatcat 16140 tttgctgcca ggatgcgggg tggacttcac ccacagccgc ctgagcaact tgttgggcat 16200 ccgcaagcgg caacccttcc aggagggctt taggatcacc tacgatgatc tggagggtgg 16260 taacattccc gcactgttgg atgtggacgc ctaccaggcg agcttgaaag atgacaccga 16320 acagggcggg ggtggcgcag gcggcagcaa cagcagtggc agcggcgcgg aagagaactc 16380 caacgcggca gccgcggcaa tgcagccggt ggaggacatg aacgatcatg ccattcgcgg 16440 cgacaccttt gccacacggg ctgaggagaa gcgcgctgag gccgaagcag cggccgaagc 16500 tgccgcccc gctgcgcaac ccgaggtcga gaagcctcag aagaaaccgg tgatcaaacc 16560 cctgacagag gacagcaaga aacgcagtta caacctaata agcaatgaca gcaccttcac 16620 ccagtaccgc agctggtacc ttgcatacaa ctacggcgac cctcagaccg gaatccgctc 16680 atggaccetg ctttgcacte etgacgtaac etgeggeteg gageaggtet aetggtegtt 16740 gccagacatg atgcaagacc ccgtgacctt ccgctccacg cgccagatca gcaactttcc 16800 ggtggtgggc gccgagctgt tgcccgtgca ctccaagagc ttctacaacg accaggccgt 16860 ctactcccaa ctcatccgcc agtttacctc tctgacccac gtgttcaatc gctttcccga 16920 gaaccagatt ttggcgcgcc cgccagcccc caccatcacc accgtcagtg aaaacgttcc 16980 tgctctcaca gatcacggga cgctaccgct gcgcaacagc atcggaggag tccagcgagt 17040 gaccattact gacgccagac gccgcacctg cccctacgtt tacaaggccc tgggcatagt 17100 ctcgccgcgc gtcctatcga gccgcacttt ttgagcaagc atgtccatcc ttatatcgcc 17160 cagcaataac acaggctggg gcctgcgctt cccaagcaag atgtttggcg gggccaagaa 17220 gcgctccgac caacacccag tgcgcgtgcg cgggcactac cgcgcgccct ggggcgcgca 17280 caaacgcggc cgcactgggc gcaccaccgt cgatgacgcc atcgacgcgg tggtggagga 17340 ggcgcgcaac tacacgccca cgccgccacc agtgtccaca gtggacgcgg ccattcagac 17400 cgtggtgcgc ggagcccggc gctatgctaa aatgaagaga cggcggaggc gcgtagcacg 17460 tcgccaccgc cgccgacccg gcactgccgc ccaacgcgcg gcggcggccc tgcttaaccg 17520 cgcacgtcgc accggccgac gggcggccat gcgggccgct cgaaggctgg ccgcgggtat 17580 tgtcactgtg ccccccaggt ccaggcgacg agcggccgcc gcagcagccg cggccattag 17640 tgctatgact cagggtcgca ggggcaacgt gtattgggtg cgcgactcgg ttagcggcct 17700 gegegtgeee gtgegeacce geeeceegeg caactagatt geaagaaaaa actaettaga 17760 ctcgtactgt tgtatgtatc cagcggcggc ggcgcgcaac gaagctatgt ccaagcgcaa 17820 aatcaaagaa gagatgctcc aggtcatcgc gccggagatc tatggccccc cgaagaagga 17880 agagcaggat tacaagcccc gaaagctaaa gcgggtcaaa aagaaaaaga aagatgatga 17940 tgatgaactt gacgacgagg tggaactgct gcacgctacc gcgcccaggc gacgggtaca 18000 gtggaaaggt cgacgcgtaa aacgtgtttt gcgacccggc accaccgtag tctttacgcc 18060 cggtgagcgc tccacccgca cctacaagcg cgtgtatgat gaggtgtacg gcgacgagga 18120 cctgcttgag caggccaacg agcgcctcgg ggagtttgcc tacggaaagc ggcataagga 18180 catgctggcg ttgccgctgg acgagggcaa cccaacacct agcctaaagc ccgtaacact 18240 gcagcaggtg ctgcccgcgc ttgcaccgtc cgaagaaaag cgcggcctaa agcgcgagtc 18300 tggtgacttg gcacccaccg tgcagctgat ggtacccaag cgccagcgac tggaagatgt 18360 cttggaaaaa atgaccgtgg aacctgggct ggagcccgag gtccgcgtgc ggccaatcaa 18420 gcaggtggcg ccgggactgg gcgtgcagac cgtggacgtt cagataccca ctaccagtag 18480 caccagtatt gccaccgcca cagagggcat ggagacacaa acgtccccgg ttgcctcagc 18540 ggtggcggat gccgcggtgc aggcggtcgc tgcggccgcg tccaagacct ctacggaggt 18600 gcaaacggac ccgtggatgt ttcgcgtttc agcccccgg cgcccgcgcg gttcgaggaa 18660 gtacggcgcc gccagcgcgc tactgcccga atatgcccta catccttcca ttgcgcctac 18720 ecceggetat egtggetaca ectacegece cagaagaega geaactacee gaegeegaac 18780 caccactgga acccgccgcc gccgtcgccg tcgccagccc gtgctggccc cgatttccgt 18840

gcgcagggtg gctcgcgaag gaggcaggac cctggtgctg ccaacagcgc gctaccaccc 18900 cagcatcgtt taaaagccgg tctttgtggt tcttgcagat atggccctca cctgccgcct 18960 ccgtttcccg gtgccgggat tccgaggaag aatgcaccgt aggaggggca tggccggcca 19020 eggeetgacg ggeggeatge gtegtgegea ceaeeggegg eggegegegt egeaeegteg 19080 catgcgcggc ggtatcctgc ccctccttat tccactgatc gccgcggcga ttggcgccgt 19140 gcccggaatt gcatccgtgg ccttgcaggc gcagagacac tgattaaaaa caagttgcat 19200 gtggaaaaat caaaataaaa agtctggact ctcacgctcg cttggtcctg taactatttt 19260 gtagaatgga agacatcaac tttgcgtctc tggccccgcg acacggctcg cgcccgttca 19320 tgggaaactg gcaagatatc ggcaccagca atatgagcgg tggcgccttc agctggggct 19380 cgctgtggag cggcattaaa aatttcggtt ccaccgttaa gaactatggc agcaaggcct 19440 ggaacagcag cacaggccag atgctgaggg ataagttgaa agagcaaaat ttccaacaaa 19500 aggtggtaga tggcctggcc tctggcatta gcggggtggt ggacctggcc aaccaggcag 19560 tgcaaaataa gattaacagt aagcttgatc cccgccctcc cgtagaggag cctccaccgg 19620 ccgtggagac agtgtctcca gaggggcgtg gcgaaaagcg tccgcgcccc gacagggaag 19680 aaactetggt gaegeaaata gaegageete eetegtaega ggaggeaeta aageaaggee 19740 tgcccaccac ccgtcccatc gcgcccatgg ctaccggagt gctgggccag cacacacccg 19800 taacgctgga cctgcctccc cccgccgaca cccagcagaa acctgtgctg ccaggcccga 19860 ccgccgttgt tgtaacccgt cctagccgcg cgtccctgcg ccgcgccgcc agcggtccgc 19920 gatcgttgcg gcccgtagcc agtggcaact ggcaaagcac actgaacagc atcgtgggtc 19980 tgggggtgca atccctgaag cgccgacgat gcttctgaat agctaacgtg tcgtatgtgt 20040 gtcatgtatg cgtccatgtc gccgccagag gagctgctga gccgccgcgc gcccgctttc 20100 caagatggct acccettega tgatgeegca gtggtettae atgeacatet egggeeagga 20160 cgcctcggag tacctgagcc ccgggctggt gcagtttgcc cgcgccaccg agacgtactt 20220 cagcetgaat aacaagttta gaaaccccac ggtggcgcct acgcacgacg tgaccacaga 20280 ccggtcccag cgtttgacgc tgcggttcat ccctgtggac cgtgaggata ctgcgtactc 20340 gtacaaggcg cggttcaccc tagctgtggg tgataaccgt gtgctggaca tggcttccac 20400 gtactttgac atccgcggcg tgctggacag gggccctact tttaagccct actctggcac 20460 tgcctacaac gccctggctc ccaagggtgc cccaaatcct tgcgaatggg atgaagctgc 20520 tactgctctt gaaataaacc tagaagaaga ggacgatgac aacgaagacg aagtagacga 20580 gcaagctgag cagcaaaaaa ctcacgtatt tgggcaggcg ccttattctg gtataaatat 20640 tacaaaggag ggtattcaaa taggtgtcga aggtcaaaca cctaaatatg ccgataaaac 20700 atttcaacct gaacctcaaa taggagaatc tcagtggtac gaaactgaaa ttaatcatgc 20760 agctgggaga gtccttaaaa agactacccc aatgaaacca tgttacggtt catatgcaaa 20820 acccacaaat gaaaatggag ggcaaggcat tcttgtaaag caacaaaatg gaaagctaga 20880 aagtcaagtg gaaatgcaat ttttctcaac tactgaggcg accgcaggca atggtgataa 20940 cttgactcct aaagtggtat tgtacagtga agatgtagat atagaaaccc cagacactca 21000 tatttcttac atgcccacta ttaaggaagg taactcacga gaactaatgg gccaacaatc 21060 tatgcccaac aggcctaatt acattgcttt tagggacaat tttattggtc taatgtatta 21120 caacagcacg ggtaatatgg gtgttctggc gggccaagca tcgcagttga atgctgttgt 21180 agatttgcaa gacagaaaca cagagctttc ataccagctt ttgcttgatt ccattggtga 21240 tagaaccagg tacttttcta tgtggaatca ggctgttgac agctatgatc cagatgttag 21300 aattattgaa aatcatggaa ctgaagatga acttccaaat tactgctttc cactgggagg 21360 tgtgattaat acagagactc ttaccaaggt aaaacctaaa acaggtcagg aaaatggatg 21420 ggaaaaagat gctacagaat tttcagataa aaatgaaata agagttggaa ataattttgc 21480 catggaaatc aatctaaatg ccaacctgtg gagaaatttc ctgtactcca acatagcgct 21540 gtatttgccc gacaagctaa agtacagtcc ttccaacgta aaaatttctg ataacccaaa 21600 cacctacgac tacatgaaca agcgagtggt ggctcccggg ttagtggact gctacattaa 21660 ccttggagca cgctggtccc ttgactatat ggacaacgtc aacccattta accaccaccg 21720 caatgctggc ctgcgctacc gctcaatgtt gctgggcaat ggtcgctatg tgcccttcca 21780 catccaggtg cctcagaagt tctttgccat taaaaacctc cttctcctgc cgggctcata 21840 cacctacgag tggaacttca ggaaggatgt taacatggtt ctgcagagct ccctaggaaa 21900 tgacctaagg gttgacggag ccagcattaa gtttgatagc atttgccttt acgccacctt 21960 cttccccatg gcccacaaca ccgcctccac gcttgaggcc atgcttagaa acgacaccaa 22020 cgaccagtcc tttaacgact atctctccgc cgccaacatg ctctacccta tacccgccaa 22080 cgctaccaac gtgcccatat ccatcccctc ccgcaactgg gcggctttcc gcggctgggc 22140 cttcacgcgc cttaagacta aggaaacccc atcactgggc tcgggctacg acccttatta 22200 cacctactct ggctctatac cctacctaga tggaaccttt tacctcaacc acacctttaa 22260 gaaggtggcc attacctttg actcttctgt cagctggcct ggcaatgacc gcctgcttac 22320 ccccaacgag tttgaaatta agcgctcagt tgacggggag ggttacaacg ttgcccagtg 22380 taacatgacc aaagactggt tcctggtaca aatgctagct aactacaaca ttggctacca 22440 gggcttctat atcccagaga gctacaagga ccgcatgtac tccttcttta gaaacttcca 22500

gcccatgagc cgtcaggtgg tggatgatac taaatacaag gactaccaac aggtgggcat 22560 cctacaccaa cacaacaact ctggatttgt tggctacctt gcccccacca tgcgcgaagg 22620 acaggeetae cetgetaaet teecetatee gettatagge aagacegeag ttgacageat 22680 tacccagaaa aagtttcttt gcgatcgcac cctttggcgc atcccattct ccagtaactt 22740 tatgtccatg ggcgcactca cagacctggg ccaaaacctt ctctacgcca actccgccca 22800 cgcgctagac atgacttttg aggtggatcc catggacgag cccacccttc tttatgtttt 22860 gtttgaagtc tttgacgtgg tccgtgtgca ccggccgcac cgcggcgtca tcgaaaccgt 22920 gtacctgcgc acgcccttct cggccggcaa cgccacaaca taaagaagca agcaacatca 22980 acaacagctg ccgccatggg ctccagtgag caggaactga aagccattgt caaagatctt 23040 ggttgtgggc catatttttt gggcacctat gacaagcgct ttccaggctt tgtttctcca 23100 cacaageteg cetgegeeat agteaataeg geeggtegeg agaetggggg egtacaetgg 23160 atggcctttg cctggaaccc gcactcaaaa acatgctacc tctttgagcc ctttggcttt 23220 tctgaccagc gactcaagca ggtttaccag tttgagtacg agtcactcct gcgccgtagc 23280 gccattgctt cttcccccga ccgctgtata acgctggaaa agtccaccca aagcgtacag 23340 gggcccaact cggccgcctg tggactattc tgctgcatgt ttctccacgc ctttgccaac 23400 tggccccaaa ctcccatgga tcacaacccc accatgaacc ttattaccgg ggtacccaac 23460 tccatgctca acagtcccca ggtacagccc accctgcgtc gcaaccagga acagctctac 23520 agetteetgg agegeeacte geectaette egeageeaca gtgegeagat taggagegee 23580 acttettttt gteaettgaa aaacatgtaa aaataatgta etagagaeae ttteaataaa 23640 ggcaaatgct tttatttgta cactctcggg tgattattta cccccaccct tgccgtctgc 23700 gccgtttaaa aatcaaaggg gttctgccgc gcatcgctat gcgccactgg cagggacacg 23760 ttgcgatact ggtgtttagt gctccactta aactcaggca caaccatccg cggcagctcg 23820 gtgaagtttt cactccacag gctgcgcacc atcaccaacg cgtttagcag gtcgggcgcc 23880 gatatettga agtegeagtt ggggeeteeg eeetgegege gegagttgeg atacaeaggg 23940 ttgcagcact ggaacactat cagcgccggg tggtgcacgc tggccagcac gctcttgtcg 24000 gagatcagat ccgcgtccag gtcctccgcg ttgctcaggg cgaacggagt caactttggt 24060 agetgeette eeaaaaaggg egegtgeeea ggetttgagt tgeactegea eegtagtgge 24120 atcaaaaggt gaccgtgccc ggtctgggcg ttaggataca gcgcctgcat aaaaqccttg 24180 atctgcttaa aagccacctg agcctttgcg ccttcagaga agaacatgcc gcaagacttg 24240 ccggaaaact gattggccgg acaggccgcg tcgtgcacgc agcaccttgc gtcggtgttg 24300 gagatetgea ceacattteg geeceacegg ttetteacga tettggeett getagaetge 24360 tectteageg egegetgeee gttttegete gteacateca ttteaateae gtgeteetta 24420 tttatcataa tgcttccgtg tagacactta agctcgcctt cgatctcagc gcagcggtgc 24480 agccacaacg cgcagcccgt gggctcgtga tgcttgtagg tcacctctgc aaacgactgc 24540 aggtacgcct gcaggaatcg ccccatcatc gtcacaaagg tcttgttgct ggtgaaggtc 24600 agctgcaacc cgcggtgctc ctcgttcagc caggtcttgc atacggccgc cagagcttcc 24660 acttggtcag gcagtagttt gaagttcgcc tttagatcgt tatccacgtg gtacttgtcc 24720 atcagegege gegeageete catgeeette teecaegeag acaegategg cacaeteage 24780 gggttcatca ccgtaatitc actttccgct tcgctgggct cttcctcttc ctcttgcgtc 24840 cgcataccac gcgccactgg gtcgtcttca ttcagccgcc gcactgtgcg cttacctcct 24900 ttgccatgct tgattagcac cggtgggttg ctgaaaccca ccatttgtag cgccacatct 24960 tetetttett cetegetgte caegattace tetggtgatg gegggegete gggettggga 25020 gaagggcgct tetttttett ettgggcgca atggccaaat eegeegeega ggtegatgge 25080 cgcgggctgg gtgtgcgcgg caccagcgcg tcttgtgatg agtcttcctc gtcctcggac 25140 tcgatacgcc gcctcatccg cttttttggg ggcgcccggg gaggcggcgg cgacggggac 25200 ggggacgaca cgtcctccat ggttggggga cgtcgcgccg caccgcgtcc gcgctcgggg 25260 gtggtttcgc gctgctcctc ttcccgactg gccatttcct tctcctatag gcagaaaaag 25320 atcatggagt cagtcgagaa gaaggacagc ctaaccgccc cctctgagtt cgccaccacc 25380 gcctccaccg atgccgccaa cgcgcctacc accttccccg tcgaggcacc cccgcttgag 25440 gaggaggaag tgattatcga gcaggaccca ggttttgtaa gcgaagacga cgaggaccqc 25500 tcagtaccaa cagaggataa aaagcaagac caggacaacg cagaggcaaa cgaggaacaa 25560 gtcgggcggg gggacgaaag gcatggcgac tacctagatg tgggagacga cgtgctgttg 25620 aagcatctgc agcgccagtg cgccattatc tgcgacgcgt tgcaagagcg cagcgatgtg 25680 cccctcgcca tagcggatgt cagccttgcc tacgaacgcc acctattctc accgcgcgta 25740 cccccaaac gccaagaaaa cggcacatgc gagcccaacc cgcgcctcaa cttctacccc 25800 gtatttgccg tgccagaggt gcttgccacc tatcacatct ttttccaaaa ctgcaagata 25860 cccctatcct gccgtgccaa ccgcagccga gcggacaagc agctggcctt gcggcagggc 25920 gctgtcatac ctgatatcgc ctcgctcaac gaagtgccaa aaatctttga gggtcttgga 25980 cgcgacgaga agcgcgcggc aaacgctctg caacaggaaa acagcgaaaa tgaaagtcac 26040 tctggagtgt tggtggaact cgagggtgac aacgcgcgcc tagccgtact aaaacgcagc 26100 atcgaggtca cccactttgc ctacccggca cttaacctac cccccaaggt catgagcaca 26160

gtcatgagtg agctgatcgt gcgccgtgcg cagcccctgg agagggatgc aaatttgcaa 26220 gaacaaacag aggagggcct acccgcagtt ggcgacgagc agctagcgcg ctggcttcaa 26280 acgcgcgagc ctgccgactt ggaggagcga cgcaaactaa tgatggccgc agtgctcgtt 26340 acceptggage ttgagtgcat geageggtte tttgetgace eggagatgea gegeaageta 26400 gaggaaacat tgcactacac ctttcgacag ggctacgtac gccaggcctg caagatctcc 26460 aacgtggagc tctgcaacct ggtctcctac cttggaattt tgcacgaaaa ccgccttggg 26520 caaaacgtgc ttcattccac gctcaagggc gaggcgccc gcgactacgt ccgcgactgc 26580 gtttacttat ttctatgcta cacctggcag acggccatgg gcgtttggca gcagtgcttg 26640 gaggagtgca acctcaagga gctgcagaaa ctgctaaagc aaaacttgaa ggacctatgg 26700 acggccttca acgagegete egtggeegeg cacetggegg acateatttt eccegaaege 26760 ctgcttaaaa ccctgcaaca gggtctgcca gacttcacca gtcaaagcat gttgcagaac 26820 tttaggaact ttatcctaga gcgctcagga atcttgcccg ccacctgctg tgcacttcct 26880 agegaetttg tgcccattaa gtacegegaa tgcccteege egetttgggg ccaetgetae 26940 cttctgcagc tagccaacta ccttgcctac cactctgaca taatggaaga cgtgagcggt 27000 gacggtctac tggagtgtca ctgtcgctgc aacctatgca ccccgcaccg ctccctggtt 27060 tgcaattcgc agctgcttaa cgaaagtcaa attatcggta cctttgagct gcagggtccc 27120 tcgcctgacg aaaagtccgc ggctccgggg ttgaaactca ctccggggct gtggacgtcg 27180 gcttaccttc gcaaatttgt acctgaggac taccacgccc acgagattag gttctacgaa 27240 gaccaatccc gcccgccaaa tgcggagctt accgcctgcg tcattaccca gggccacatt 27300 cttggccaat tgcaagccat caacaaagcc cgccaagagt ttctgctacg aaagggacgg 27360 ggggtttact tggaccccca gtccggcgag gagctcaacc caatcccccc gccgccgcag 27420 ccctatcagc agcagccgcg ggcccttgct tcccaggatg gcacccaaaa agaagctgca 27480 gctgccgccg ccacccacgg acgaggagga atactgggac agtcaggcag aggaggtttt 27540 ggacgaggag gaggaggaca tgatggaaga ctgggagagc ctagacgagg aagcttccga 27600 ggtcgaagag gtgtcagacg aaacaccgtc accctcggtc gcattcccct cgccggcgcc 27660 ccagaaatcg gcaaccggtt ccagcatggc tacaacctcc gctcctcagg cgccgccggc 27720 actgcccgtt cgccgaccca accgtagatg ggacaccact ggaaccaggg ccggtaagtc 27780 caagcagccg ccgccgttag cccaagagca acaacagcgc caaggctacc gctcatggcg 27840 cgggcacaag aacgccatag ttgcttgctt gcaagactgt gggggcaaca tctccttcgc 27900 ccgccgcttt cttctctacc atcacggcgt ggccttcccc cgtaacatcc tgcattacta 27960 ccgtcatctc tacageccat actgeaccgg cggcageggc ageggcagea acageagegg 28020 ccacacagaa gcaaaggcga ccggatagca agactctgac aaagcccaag aaatccacag 28080 cggcggcagc agcaggagga ggagcgctgc gtctggcgcc caacgaaccc gtatcgaccc 28140 gcgagcttag aaacaggatt tttcccactc tgtatgctat atttcaacag agcaggggcc 28200 aagaacaaga gctgaaaata aaaaacaggt ctctgcgatc cctcacccgc agctgcctgt 28260 atcacaaaag cgaagatcag cttcggcgca cgctggaaga cgcggaggct ctcttcagta 28320 aatactgcgc gctgactctt aaggactagt ttcgcgccct ttctcaaatt taagcgcgaa 28380 aactacgtca tctccagcgg ccacacccgg cgccagcacc tgtcgtcagc gccattatga 28440 gcaaggaaat tcccacgccc tacatgtgga gttaccagcc acaaatggga cttgcggctg 28500 gagetgeeca agaetaetea accegaataa actacatgag egegggaece cacatgatat 28560 cccgggtcaa cggaatccgc gcccaccgaa accgaattct cttggaacag gcggctatta 28620 ccaccacacc tegtaataac ettaateeee gtagttggee egetgeeetg gtgtaccagg 28680 aaagteeege teecaceaet gtggtaette eeagagaege eeaggeegaa gtteagatga 28740 ctaactcagg ggcgcagctt gcgggcggct ttcgtcacag ggtgcggtcg cccgggcagg 28800 gtataactca cctgacaatc agaggcgag gtattcagct caacgacgag tcggtgagct 28860 cctcgcttgg tctccgtccg gacgggacat ttcagatcgg cggcgccggc cgtccttcat 28920 tracgerteg traggerate ctaactetge agacetegte etetgagerg egetetggag 28980 gcattggaac tctgcaattt attgaggagt ttgtgccatc ggtctacttt aaccccttct 29040 cgggacctcc cggccactat ccggatcaat ttattcctaa ctttgacgcg gtaaaggact 29100 cggcggacgg ctacgactga atgttaagtg gagaggcaga gcaactgcgc ctgaaacacc 29160 tggtccactg tcgccgccac aagtgctttg cccgcgactc cggtgagttt tgctactttg 29220 aattgeeega ggateatate gagggeeegg egeaeggegt eeggettace geeeagggag 29280 agettgeeeg tageetgatt egggagttta eecagegeee eetgetagtt gagegggaea 29340 ggggaccctg tgttctcact gtgatttgca actgtcctaa ccttggatta catcaagatc 29400 ctctagttat aactagagta cccggggatc ttattccctt taactaataa aaaaaaataa 29460 taaagcatca cttacttaaa atcagttagc aaatttctgt ccagtttatt cagcagcacc 29520 teettgeeet eeteeeaget etggtattge agetteetee tggetgeaaa ettteteeac 29580 aatctaaatg gaatgtcagt ttcctcctgt tcctgtccat ccgcacccac tatcttcatg 29640 ttgttgcaga tgaagcgcgc aagaccgtct gaagatacct tcaaccccgt gtatccatat 29700 gacacggaaa ceggteetee aactgtgeet tttettaete etecetttgt atcecceaat 29760 gggtttcaag agagtccccc tggggtactc tctttgcgcc tatccgaacc tctagttacc 29820

tccaatggca tgcttgcgct caaaatgggc aacggcctct ctctggacga ggccggcaac 29880 cttacctccc aaaatgtaac cactgtgagc ccacctctca aaaaaaccaa gtcaaacata 29940 aacctggaaa tatctgcacc cctcacagtt acctcagaag ccctaactgt ggctgccgcc 30000 gcacctctaa tggtcgcggg caacacatt accatgcaat cacaggcccc gctaaccgtg 30060 cacgactcca aacttagcat tgccacccaa ggacccctca cagtgtcaga aggaaagcta 30120 gccctgcaaa catcaggccc cctcaccacc accgatagca gtacccttac tatcactgcc 30180 tcacccctc taactactgc cactggtagc ttgggcattg acttgaaaga gcccatttat 30240 acacaaaatg gaaaactagg actaaagtac ggggctcctt tgcatgtaac agacgaccta 30300 aacactttga ccgtagcaac tggtccaggt gtgactatta ataatacttc cttgcaaact 30360 aaagttactg gagccttggg ttttgattca caaggcaata tgcaacttaa tgtagcagga 30420 ggactaagga ttgattctca aaacagacgc cttatacttg atgttagtta tccgtttgat 30480 gctcaaaacc aactaaatct aagactagga cagggccctc tttttataaa ctcagcccac 30540 aacttggata ttaactacaa caaaggcctt tacttgttta cagcttcaaa caattccaaa 30600 aagcttgagg ttaacctaag cactgccaag gggttgatgt ttgacgctac agccatagcc 30660 attaatgcag gagatgggct tgaatttggt tcacctaatg caccaaacac aaatcccctc 30720 aaaacaaaaa ttggccatgg cctagaattt gattcaaaca aggctatggt tcctaaacta 30780 ggaactggcc ttagttttga cagcacaggt gccattacag taggaaacaa aaataatgat 30840 aagctaactt tgtggaccac accagctcca tctcctaact gtagactaaa tgcagagaaa 30900 gatgctaaac tcactttggt cttaacaaaa tgtggcagtc aaatacttgc tacagtttca 30960 gttttggctg ttaaaggcag tttggctcca atatctggaa cagttcaaag tgctcatctt 31020 attataagat ttgacgaaaa tggagtgcta ctaaacaatt ccttcctgga cccagaatat 31080 tggaacttta gaaatggaga tettaetgaa ggeacageet atacaaacge tgttggattt 31140 atgectaace tateagetta tecaaaatet eaeggtaaaa etgecaaaag taacattgte 31200 agtcaagttt acttaaacgg agacaaaact aaacctgtaa cactaaccat tacactaaac 31260 ggtacacagg aaacaggaga cacaactcca agtgcatact ctatgtcatt ttcatgggac 31320 tggtctggcc acaactacat taatgaaata tttgccacat cctcttacac tttttcatac 31380 attgcccaag aataaagaat cgtttgtgtt atgtttcaac gtgtttattt ttcaattgca 31440 gaaaatttca agtcattttt cattcagtag tatagcccca ccaccacata gcttatacag 31500 atcaccgtac cttaatcaaa ctcacagaac cctagtattc aacctgccac ctccctccca 31560 acacacagag tacacagtcc tttctccccg gctggcctta aaaagcatca tatcatgggt 31620 aacagacata ttcttaggtg ttatattcca cacggtttcc tgtcgagcca aacgctcatc 31680 agtgatatta ataaactccc cgggcagctc acttaagttc atgtcgctgt ccagctgctg 31740 agccacaggc tgctgtccaa cttgcggttg cttaacgggc ggcgaaggag aagtccacgc 31800 ctacatgggg gtagagtcat aatcgtgcat caggataggg cggtggtgct gcagcagcgc 31860 gcgaataaac tgctgccgcc gccgctccgt cctgcaggaa tacaacatgg cagtggtctc 31920 ctcagcgatg attcgcaccg cccgcagcat aaggcgcctt gtcctccggg cacagcagcg 31980 caccetgate teaettaaat cagcacagta actgcagcac agcaccacaa tattgttcaa 32040 aatcccacag tgcaaggcgc tgtatccaaa gctcatggcg gggaccacag aacccacgtg 32100 gccatcatac cacaagcgca ggtagattaa gtggcgaccc ctcataaaca cgctggacat 32160 aaacattacc tettttggca tgttgtaatt caccacetee eggtaccata taaacetetg 32220 attaaacatg gcgccatcca ccaccatcct aaaccagctg gccaaaacct gcccgccggc 32280 tatacactgc agggaaccgg gactggaaca atgacagtgg agagcccagg actcgtaacc 32340 atggatcatc atgctcgtca tgatatcaat gttggcacaa cacaggcaca cgtgcataca 32400 cttcctcagg attacaagct cctcccgcgt tagaaccata tcccagggaa caacccattc 32460 ctgaatcagc gtaaatccca cactgcaggg aagacctcgc acgtaactca cgttgtgcat 32520 tgtcaaagtg ttacattcgg gcagcagcgg atgatcctcc agtatggtag cgcgggtttc 32580 tgtctcaaaa ggaggtagac gatccctact gtacggagtg cgccgagaca accgagatcg 32640 tgttggtcgt agtgtcatgc caaatggaac gccggacgta gtcatatttc ctgaagcaaa 32700 accaggtgcg ggcgtgacaa acagatctgc gtctccggtc tcgccgctta gatcgctctg 32760 tgtagtagtt gtagtatatc cactetetea aageateeag gegeeeettg gettegggtt 32820 ctatgtaaac teetteatge geegetgeee tgataacate caccacegea gaataageea 32880 cacccagcca acctacacat togttotgog agtcacacac gggaggagog ggaagagotg 32940 gaagaaccat gttttttttt ttattccaaa agattatcca aaacctcaaa atgaagatct 33000 attaagtgaa cgcgctcccc tccggtggcg tggtcaaact ctacagccaa agaacagata 33060 atggcatttg taagatgttg cacaatggct tccaaaaggc aaacggccct cacgtccaag 33120 tggacgtaaa ggctaaaccc ttcagggtga atctcctcta taaacattcc agcaccttca 33180 accatgeeca aataattete atetegeeae etteteaata tatetetaag caaateeega 33240 atattaagtc cggccattgt aaaaatctgc tccagagcgc cctccacctt cagcctcaag 33300 cagcgaatca tgattgcaaa aattcaggtt cctcacagac ctgtataaga ttcaaaagcg 33360 gaacattaac aaaaataccg cgatcccgta ggtcccttcg cagggccagc tgaacataat 33420 cgtgcaggtc tgcacggacc agcgcggcca cttccccgcc aggaaccttg acaaaagaac 33480

```
ccacactgat tatgacacgc atactcggag ctatgctaac cagcgtagcc ccgatgtaag 33540
ctttgttgca tgggcggcga tataaaatgc aaggtgctgc tcaaaaaatc aggcaaagcc 33600
tegegeaaaa aagaaageae ategtagtea tgeteatgea gataaaggea ggtaagetee 33660
ggaaccacca cagaaaaaga caccattttt ctctcaaaca tgtctgcggg tttctgcata 33720
aacacaaaat aaaataacaa aaaaacattt aaacattaga agcctgtctt acaacaggaa 33780
aaacaaccct tataagcata agacggacta cggccatgcc ggcgtgaccg taaaaaaact 33840
ggtcaccgtg attaaaaagc accaccgaca gctcctcggt catgtccgga gtcataatgt 33900
aagactcggt aaacacatca ggttgattca tcggtcagtg ctaaaaagcg accgaaatag 33960-
cccgggggaa tacatacccg caggcgtaga gacaacatta cagcccccat aggaggtata 34020
acaaaattaa taggagagaa aaacacataa acacctgaaa aaccctcctg cctaggcaaa 34080
atagcaccct cccgctccag aacaacatac agcgcttcac agcggcagcc taacagtcag 34140
ccttaccagt aaaaaagaaa acctattaaa aaaacaccac tcgacacggc accagctcaa 34200
tcaqtcacag tgtaaaaaag ggccaagtgc agagcgagta tatataggac taaaaaatga 34260
cqtaacqqtt aaagtccaca aaaaacaccc agaaaaccgc acgcgaacct acgcccagaa 34320
acquaaqcca aaaaacccac aacttcctca aatcgtcact tccgttttcc cacgttacgt 34380
aacttcccat tttaagaaaa ctacaattcc caacacatac aagttactcc gccctaaaac 34440
ctacgtcacc cgccccgttc ccacgccccg cgccacgtca caaactccac cccctcatta 34500
tcatattggc ttcaatccaa aataaggtat attattgatg atnnnnntta attaa
```

```
<210> 6
<211> 1740
<212> DNA
<213> Homo sapiens
<220>
<223> human full-length L523S lung squamous cell carcinoma cancer antigen cDNA
```

<400> 6 atgaacaaac tgtatatcgg aaacctcagc gagaacgccg cccctcgga cctagaaagt 60 atottcaagg acgccaagat cccggtgtcg ggaccettcc tggtgaagac tggctacgcg 120 ttcgtggact gcccggacga gagctgggcc ctcaaggcca tcgaggcgct ttcaggtaaa 180 atagaactgc acgggaaacc catagaagtt gagcactcgg tcccaaaaag gcaaaggatt 240 cggaaacttc agatacgaaa tatcccgcct catttacagt gggaggtgct ggatagttta 300 ctagtccagt atggagtggt ggagagctgt gagcaagtga acactgactc ggaaactgca 360 gttgtaaatg taacctattc cagtaaggac caagctagac aagcactaga caaactgaat 420 ggatttcagt tagagaattt caccttgaaa gtagcctata tccctgatga aacggccgcc 480 cagcaaaacc ccttgcagca gccccgaggt cgccgggggc ttgggcagag gggctcctca 540 aggeaggggt etecaggate egtateeaag eagaaaceat gtgatttgee tetgegeetg 600 ctggttccca cccaatttgt tggagccatc ataggaaaag aaggtgccac cattcggaac 660 atcaccaaac agacccagtc taaaatcgat gtccaccgta aagaaaatgc gggggctgct 720 gagaagtega ttactateet etetaeteet gaaggeacet etgeggettg taagtetatt 780 ctggagatta tgcataagga agctcaagat ataaaattca cagaagagat ccccttgaag 840 attttagctc ataataactt tgttggacgt cttattggta aagaaggaag aaatcttaaa 900 aaaattgagc aagacacaga cactaaaatc acgatatctc cattgcagga attgacgctg 960 tataatccag aacgcactat tacagttaaa ggcaatgttg agacatgtgc caaagctgag 1020 gaggagatca tgaagaaaat cagggagtct tatgaaaatg atattgcttc tatgaatctt 1080 caagcacatt taattcctgg attaaatctg aacgccttgg gtctgttccc acccacttca 1140 gggatgccac ctcccacctc agggccccct tcagccatga ctcctcccta cccgcagttt 1200 gagcaatcag aaacggagac tgttcatctg tttatcccag ctctatcagt cggtgccatc 1260 ateggcaage agggccagea cateaageag ettteteget ttgetggage tteaattaag 1320 attgctccag cggaagcacc agatgctaaa gtgaggatgg tgattatcac tggaccacca 1380 gaggctcagt tcaaggctca gggaagaatt tatggaaaaa ttaaagaaga aaactttgtt 1440 agtcctaaag aagaggtgaa acttgaagct catatcagag tgccatcctt tgctgctggc 1500 agagttattg gaaaaggagg caaaacggtg aatgaacttc agaatttgtc aagtgcagaa 1560 gttgttgtcc ctcgtgacca gacacctgat gagaatgacc aagtggttgt caaaataact 1620 ggtcacttct atgcttgcca ggttgcccag agaaaaattc aggaaattct gactcaggta 1680 aagcagcacc aacaacagaa ggctctgcaa agtggaccac ctcagtcaag acggaagtaa 1740 <210> 7

<211> 579

<212> PRT

<213> Homo sapiens

<220>

<223> human full-length L523S lung squamous cell carcinoma cancer antigen

<400> 7

Met Asn Lys Leu Tyr Ile Gly Asn Leu Ser Glu Asn Ala Ala Pro Ser 1 5 10 15

Asp Leu Glu Ser Ile Phe Lys Asp Ala Lys Ile Pro Val Ser Gly Pro 20 25 30

Phe Leu Val Lys Thr Gly Tyr Ala Phe Val Asp Cys Pro Asp Glu Ser 35 40 45

Trp Ala Leu Lys Ala Ile Glu Ala Leu Ser Gly Lys Ile Glu Leu His
50 55 60

Gly Lys Pro Ile Glu Val Glu His Ser Val Pro Lys Arg Gln Arg Ile 65 70 75 80

Arg Lys Leu Gln Ile Arg Asn Ile Pro Pro His Leu Gln Trp Glu Val 85 90 95

Leu Asp Ser Leu Leu Val Gln Tyr Gly Val Val Glu Ser Cys Glu Gln 100 105 110

Val Asn Thr Asp Ser Glu Thr Ala Val Val Asn Val Thr Tyr Ser Ser 115 120 125

Lys Asp Gln Ala Arg Gln Ala Leu Asp Lys Leu Asn Gly Phe Gln Leu 130 135 140

Glu Asn Phe Thr Leu Lys Val Ala Tyr Ile Pro Asp Glu Thr Ala Ala 145 150 155 160

Gln Gln Asn Pro Leu Gln Gln Pro Arg Gly Arg Arg Gly Leu Gly Gln 165 170 175

Arg Gly Ser Ser Arg Gln Gly Ser Pro Gly Ser Val Ser Lys Gln Lys 180 185 190

Pro Cys Asp Leu Pro Leu Arg Leu Leu Val Pro Thr Gln Phe Val Gly
195 200 205

Ala Ile Ile Gly Lys Glu Gly Ala Thr Ile Arg Asn Ile Thr Lys Gln 210 215 220

Thr Gln Ser Lys Ile Asp Val His Arg Lys Glu Asn Ala Gly Ala Ala 225 230 235 240

Glu Lys Ser Ile Thr Ile Leu Ser Thr Pro Glu Gly Thr Ser Ala Ala 245 250 255

Cys Lys Ser Ile Leu Glu Ile Met His Lys Glu Ala Gln Asp Ile Lys 260 265 270

Phe Thr Glu Glu Ile Pro Leu Lys Ile Leu Ala His Asn Asn Phe Val 280 Gly Arg Leu Ile Gly Lys Glu Gly Arg Asn Leu Lys Lys Ile Glu Gln Asp Thr Asp Thr Lys Ile Thr Ile Ser Pro Leu Gln Glu Leu Thr Leu 315 Tyr Asn Pro Glu Arg Thr Ile Thr Val Lys Gly Asn Val Glu Thr Cys 330 Ala Lys Ala Glu Glu Glu He Met Lys Lys Ile Arg Glu Ser Tyr Glu Asn Asp Ile Ala Ser Met Asn Leu Gln Ala His Leu Ile Pro Gly Leu 360 Asn Leu Asn Ala Leu Gly Leu Phe Pro Pro Thr Ser Gly Met Pro Pro Pro Thr Ser Gly Pro Pro Ser Ala Met Thr Pro Pro Tyr Pro Gln Phe Glu Gln Ser Glu Thr Glu Thr Val His Leu Phe Ile Pro Ala Leu Ser Val Cly Ala Ile Ile Gly Lys Gln Gly Gln His Ile Lys Gln Leu Ser Arg Phe Ala Gly Ala Ser Ile Lys Ile Ala Pro Ala Glu Ala Pro Asp Ala Lys Val Arg Met Val Ile Ile Thr Gly Pro Pro Glu Ala Gln Phe 455 Lys Ala Gln Gly Arg Ile Tyr Gly Lys Ile Lys Glu Glu Asn Phe Val Ser Pro Lys Glu Glu Val Lys Leu Glu Ala His Ile Arg Val Pro Ser 490 Phe Ala Ala Gly Arg Val Ile Gly Lys Gly Gly Lys Thr Val Asn Glu Leu Gln Asn Leu Ser Ser Ala Glu Val Val Pro Arg Asp Gln Thr 520 Pro Asp Glu Asn Asp Gln Val Val Lys Ile Thr Gly His Phe Tyr 530 535 Ala Cys Gln Val Ala Gln Arg Lys Ile Gln Glu Ile Leu Thr Gln Val

Lys Gln His Gln Gln Gln Lys Ala Leu Gln Ser Gly Pro Pro Gln Ser